

APPLICATION FOR RENEWAL OF NPDES PERMIT NO. WA-002515-1

Attachment G

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Attachment G – Description of the Condenser Replacement Project
(4 pages)

CONDENSER REPLACEMENT PROJECT

Columbia Generating Station (CGS)

October 2010

The CGS main condenser will be replaced during the 2011 refueling outage (R-20) in an effort to improve plant reliability. The existing main condenser will be removed in sections from the Turbine Generator Building through a temporary access point. Subsequently, the new titanium condenser will be moved into the Turbine Generator Building and installed. This document describes the objectives, scope of work, business need, and the phases of the condenser replacement project.

Project Objectives

The objectives for replacing the main condenser include:

1. Improve reactor fuel integrity by eliminating the copper content in the reactor feed water.
2. Removing the copper condenser tubes to reduce radiation exposure.
3. Improve operational reliability by reducing recurring condenser tube leaks.
4. Improve CGS costs associated with down power evolutions.
5. Improved nuclear industry perspective; the potential for fuel damage resulting from copper corrosion is a high interest issue within the nuclear industry and CGS is lagging the industry in this area.

Main Condenser Replacement Project Scope of Work

A Condenser Conceptual Study was completed February 29, 2008 by Westinghouse and Sargent & Lundy with input from consultants and CGS stakeholders. This study performed an evaluation of potential options for the main condenser module replacement to provide Energy Northwest the information required to understand the various complexities associated with replacing the main condenser modules. The scope of work has evolved since the Conceptual Study and includes:

- Installation and removal of Condenser Module & Maintenance Storage Building (CM&MSB)
- Installation and removal of the Temporary Handling Building
- Installation of a Temporary Access Point into the Turbine Generator Building
- Installation and removal of temporary housing

- Condenser Module Receipt Inspection and transfer to CM&MSB
- Condenser Module Replacement
- Heater Drain and Air Removal Piping Relocation
- Rigging Installation
- Interference Removal and Restoration
- Performance Monitoring Instrumentation

Project Deliverables Include:

- New Condenser Modules (12)
- Revised Air Removal System
- New Water Boxes (9)
- Improved Megawatt Output
- Revised Condenser Tracer Gas System
- New Instrument & Controls System – monitoring flow, temperature and pressure
- Improved Safety Hardware in Condenser – permanent.

Business Need

An Energy Northwest business case was presented to the Executive Board in December 2007 with the results indicating modular titanium replacement was the best option on a life cycle net present value basis. An independent business case initiated in December 2007 has been completed by Huron. The Huron Business Case states that technical, economic, and regional impact factors drive the need to replace the Main Condenser by 2015 and that replacing the condenser modules in 2011 is financially more advantageous than deferring replacement to a later Refuel Outage. Replacement of the condenser will achieve the following objectives:

1. Improve reactor fuel integrity by eliminating the copper content in the reactor feed water. Copper deposits on the reactor fuel poses a continuing risk of fuel cladding damage and fuel failure events.
2. Reduce collective CGS radiation exposure. Copper from the current condenser contributes to increased plant radiation exposure and contributes to additional decontamination activities and increased costs. Plant downpower evolutions to repair leaking condenser tubes increase radiation exposure.
3. Improve operational reliability by reducing recurring condenser tube leaks. Tube leaks lead to forced downpower or plant shutdown evolutions to repair the tube leaks.
4. Improve CGS costs associated with downpower evolutions, forced outages, increased dose, additional decontamination activities, and lost plant generation.

5. Improved nuclear industry perspective; the potential for fuel damage resulting from copper corrosion is a high interest issue within the nuclear industry and CGS is lagging the industry in this area. Replacing the copper main condenser tubes with titanium modules is recognized and an appropriate modification for CGS.

Project Phases

The following project phases describe the progression of the condenser replacement project from initiation through closeout:

Initiation/Planning

FY-2008

- ▣ Conceptual Study "Project Plan"
- ▣ R-19 Design Changes (Electrical, Mechanical, Civil) for removal of plant interferences
- ▣ Procurement Specification for new Condenser Modules
- ▣ Initiate contract for turnkey R-19/R-20 Contractor

Design/Procurement-Manufacture

FY-2009

- ▣ Complete Engineering and Planning for R-19 design modifications
- ▣ Award condenser modular tube bundle contract and start fabrication
- ▣ Site Support Contractor:
 - Award Contract
 - Implement R-19 design modifications

FY-2010

- ▣ Begin on-line design modifications
- ▣ Prepare project site for receipt of the condenser modules
- ▣ Complete R-20 Design Changes

Implementation

FY-2011

- ▣ Complete on-line design modifications
- ▣ Delivery of Condenser modules, water boxes, and field weld pieces from Condenser Manufacturer
- ▣ Complete R-20 Work Order Planning
- ▣ Complete facility structures to support Project Implementation
- ▣ Implement R-20 design modifications
- ▣ Replace Condenser, water boxes and field weld pieces
- ▣ Award contract to disposition existing condenser module, water box and field weld pieces material
- ▣ Condenser Performance Testing

FY-2012

- ▣ Disposition existing condenser modules, water boxes, and field weld pieces

Closeout

- ▣ Demobilization
- ▣ Project Closeout